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A NEW SOMATOCHLORA, WITH A NOTE ON THE SPECIES KNOWN FROM ONTARIO.

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In my "First List of Ontario Odonata" (CAN. ENT., XXXVIII; 1906, p. 151), I recorded *Somatochlora elongata* (Scudd.) from Toronto, De Grassi Point (Lake Simcoe) and Algonquin Park, and remarked upon the fact that the superior appendages of the male were more incurved in the examples from Toronto and Lake Simcoe than in those from Algonquin Park. A further study of these specimens revealed other marks of distinction, and led me to the conclusion that the two forms were specifically distinct, those from Algonquin Park belonging to true *elongata*, while the others represented a closely allied but apparently undescribed species. Mr. E. B. Williamson, to whom I sent sketches of the abdominal appendages of both forms, wrote that he had also taken them both, and was likewise of the opinion that the species in question was new. Dr. Calvert, to whom I sent a specimen, expressed the same opinion, and added that he had a pair of the same form from Sherbrooke, Que., taken by L'Abbé Begin. Since then I have examined these specimens myself.

I also learned through Mr. Williamson that the description of the nymph of *elongata*, as given by Prof. Needham (Aquatic Insects in the Adirondacks, Bull. 47, N. Y. State Mus., 1901, 499), probably belongs to the same new species. I have one of Needham's specimens from the same locality before me, and it is certainly identical with my other specimens. Needham's figures of the appendages are from specimens in the Museum of Comparative Zoology, Cambridge, Mass., and are those of true *elongata*.

Somatochlora Williamsons, sp. nov.

1901. *Somatochlora elongata*, Needham, Aq. Ins. in the Ad., Bull. 47, N. Y. State Mus., 499.

1906. *Somatochlora elongata*, Walker, CAN. ENT., XXXVIII, 151.

Closely related to *S. elongata* (Scudd.), with which it agrees in size and proportions, but differs in the form of the superior abdominal appendages of the ♂ and in certain details of colour pattern.

Vertex very dark metallic green, evenly punctate. Frons above and in front dark metallic greenish-blue, bordered below and at the sides by a brownish-yellow band. The dark area, except a narrow median smooth space at the bottom of the depression above, is rather coarsely and irregularly pitted and covered by dark brown pile, while in the lighter yellowish parts the pits are much finer and the pile, as elsewhere in the face, paler. Anteclypeus and labrum pale yellow; postclypeus reddish- or yellowish-brown, generally much darker in its middle part, but not forming as distinct a dark band between the lighter parts above and below it as it does in *elongata*, in which the middle portion and sometimes the entire postclypeus forms a strong dark brown or black band between the paler parts of the frons and anteclypeus. Labrum black. Occiput shining reddish-brown, well rounded behind, bearing dense dark brown hairs above, pale brownish ones behind. Posterior surface of head shining black, with a submarginal dense row of long pale brownish hairs in line with those of the occiput.

Prothorax black, anterior lobe broadly margined with very pale yellow, posterior lobe dull metallic bronze-green, with pale brownish hairs, convex behind. Meso- and metathorax dull metallic green, with blue or violet-blue reflections, especially upon the epimera, covered with long pale yellowish-brown hairs, except upon the antealar sinus, where the hairs are dark brown, very short and denser than elsewhere. A few black hairs also about the bases of both pairs of wings. A dull yellow mesepimeral band usually 4-6 times as long as broad, and an elongate-oval metepimeral spot of the same colour. These markings may be very inconspicuous in old examples. Under parts of thorax pale yellowish brown. Legs black with the following parts yellowish-brown: the coxæ, or greater part of them, first and upper surface of second trochanters, first femora, except near the knees and sometimes the under surface, upper surface of second femora except distally.

Abdomen slightly more than $2\frac{1}{2}$ times as long as head and thorax, tumid at base, narrowest before middle of 3, thence expanding to apex of 5, where width about equals base of 2, sides of 6 parallel, remaining segments very gradually narrowing. Colour dull dark bronzy-green, covered with fine short pale brownish hairs; sides of 2 and base of 3 shining dark brown with conspicuous pale brownish hairs, genital lobe black. A brownish yellow band on lateral surface of 2 in its lower half, passing just above genital lobe, where it is generally constricted and often

divided into two spots and continued posteriorly as a ventro-lateral triangular spot on base of 3. Dorsum of 2 with a yellowish spot on each side distally, followed on dorsum of 3 by a smaller and sometimes obsolete basal spot which is often connected below with the ventro-lateral spot of the same segment.

Superior appendages black, about as long as $9 + 10$, separated at their origin by a space about equal in width to base of one of the appendages; the latter broadest at base, becoming narrower and somewhat incurved in proximal fourth, where both margins as seen from above are gently concave; middle third gradually approaching middle line, somewhat tumid and rounded, with sides parallel; distal third very slightly tapering, bent inwards, forming an angle of about 40° with its fellow of the opposite side. Viewed from the side they appear distinctly but not strongly arched, with the apices strongly upturned and ending in a recurved point. The outer margin is bent downwards and bears a large but obtuse basal tooth, usually followed before the middle by another very inconspicuous one, after which it fades into the rounded lateral surface. Both teeth are usually visible from above. Ventral surface concave at base, beyond rounded and somewhat tumid. A slight ridge passes from the concavity obliquely backwards and inwards, forming a prominence which appears as a very obtuse and rounded angle when viewed from the side, thence continued as the slightly angular inner margin. The hairs on distal half above are long and dense, being much longer than depth of appendage.

Inferior appendage about half as long as superiors, triangular, about $\frac{2}{3}$ as broad at base as long, sides slightly convex, apex rounded, lateral surfaces sulcate; in profile view it forms a shallow curve with the concavity upwards, the upper and lower margins nearly parallel, apex surmounted by a short recurved tooth.

♀ differs from ♂ in markings as follows: The ventro-lateral spot on 2 is unbroken, well-defined above, but fades below into the dull yellowish brown which covers most of the ventral surface of 2 and 3. Dorsum of 3 is broadly margined with brownish yellow, most conspicuous on proximal half, and continued as a less distinct elongate spot on basal third of 4. Indistinct spots of same colour occupy antero-lateral angles of 5, 6, 7 and 8. Abdomen broadest at middle of 2, where it is about twice as broad as at base of 9, tapering equally to middle of 9, whose sides diverge in distal half so that breadth at apex is about $\frac{1}{4}$ greater

than at base. Apex of 10 nearly equal to base of 9. Ventro-lateral margins of 8, 9 and 10 and ventral surfaces of 9 and 10 yellowish, vulvar lamina rather longer than depth of 8 at apex, spout-shaped, elongate triangular in profile, with ventral surface slightly concave, apex rounded.

Appendages $\frac{1}{2}$ longer than 9 + 10, black, evenly covered with short hairs, slender, subcylindrical, slightly bent inwards in proximal half, enlarging distally its proximal two-thirds, thence narrowing again very slightly, apex rounded. A slight carina runs along outer ventro-lateral margin in its proximal half.

Wings (σ f) hyaline, yellow at base in f , becoming somewhat suffused with brownish in old examples, venation black, pterostigma dark brown.

Front-wings: Antecubitals 7-8, postcubitals 5-9, usually 7; triangles 2-celled, internal triangles 3-celled, one submedian cross-vein on a level with the first antecubital; 3 post-triangular cells, followed by 2 rows of cells to near the level of separation of the median and principal sectors, then 3 rows; generally 4-5 cells at the margin; membranula sooty-gray.

Hind-wings: Antecubitals commonly 5, sometimes 6, postcubitals 6-10, generally 7-9; triangles 2-celled, internal triangles free, one other submedian cross-vein before the level of the first antecubital; 3 post-triangular cells (1 f has 2 on one side, 4 on the other) followed by 2 very short rows of cells, then 3 rows which divide and subdivide until at the margin there are 9-12 cells; anal triangle of σ 2-celled; membranula sooty-gray, paler towards base, the pale area usually confined to a small spot at the immediate base, but sometimes diffused over the basal half.

Dimensions: Abdomen (incl. apps.) σ 41-45, f 45.5-46; sup. apps. σ 4, apps. f 4.5-5.25; hind-wing σ 37-40, f 39-40; pterostigma 2.6-3; hind femur σ 8.5-9, f 8-8.5 mm.

This species is most nearly related to *S. elongata* (Scudd.), from which it differs chiefly in the superior appendages of the male. In *elongata* these appear, when viewed from above, slenderer, straighter and more regular in outline. The proximal half is slightly bent inwards, but in the distal half they are parallel, with the apices well separated. The basal tooth is much smaller than in *Williamsoni*, and invisible from above, while there is no second tooth before the middle. On the other hand the carina on the under surface is much better developed, beginning as a prominent tooth, where in *Williamsoni* only a rounded eminence occurs. In profile

the appendage is less arched and the apices not so strongly recurved. The hairs on the upper surface are shorter and not so dense. The inferior appendage is a little more than half as long as the superiors. *Elongata* also differs in the much brighter and better defined yellow markings on the sides of the thorax and second abdominal segment, which, however, have much the same form and distribution. The brown of the legs is reduced to the coxæ and a streak along the proximal half or more of the upper surface of the first femora.

The dorsal view of the ♂ appendages is in some respects more like that of *S. minor*, Calv., but the superiors in the latter are relatively shorter, more slender, and are more widely separated at base, the apices are not so much upcurved and the hairs are much shorter and more thinly and evenly distributed. The basal tooth is smaller and the inferior carina bears a prominent tooth as in *elongata*.

Of European species *Williamsoni* comes nearest to *S. flavomaculata* (Lind.), but differs from it quite obviously in both appendages and colour-pattern.

Described from 10 ♂♂, 3 ♀♀. Toronto, June, 1901, 1 ♂ in house; De Grassi Point, Lake Simcoe, Ont., June 29–Aug. 1, 5 ♂♂, 3 ♀♀; Temagami, Ont., Aug. 15, 1906, 1 ♂ (P. Hahn.); Oden, Mich., Aug. 11, 1906, 2 ♂♂ (E. B. Williamson); Bone Pond, Saranac Inn, N. Y., July 26, 1900, 1 ♂ (J. G. Needham).

The known range of this species, including the Sherbrooke record, is thus from Quebec and north-eastern New York to northern Ontario and Michigan. It belongs, apparently, to the Canadian and Transition Zones, being evidently rare at Toronto, which lies towards the southern boundary of the Transition Zone, but much more numerous northward.

I take pleasure in naming this insect after Mr. E. B. Williamson, who has shown me many favours of late and given me a great deal of valuable advice and assistance in my studies of dragon-fly life.

He writes me that his specimens were taken about 4 p. m. on Aug. 11, 1906, "at the mouth of the Minnehaha, a small stream flowing into Crooked Lake, Oden, Michigan. The Minnehaha, as it approaches Crooked Lake, pursues a circuitous course through a large prairie-like and marshy tract. The *Somatochloras* were observed feeding along the shore line among the rank cattail or Sparganium growth just at the water's edge. They were leisurely in their movements, spending much time at a place,

before rising slightly and moving to another location. Earlier in the day a *Somatochlora* (?) of similar size was seen over a clearing near the lake, flying at an average height of possibly 20 feet."

At De Grassi Point, Lake Simcoe, they are quite numerous during the latter part of June and July, and are occasionally met with in August. Here they frequent woodland roads and glades, where I have most often seen them late in the afternoon, hovering in the sunshine in the manner described by Mr. Williamson, sometimes in considerable numbers. They seldom descend within reach of the net, however, flying usually at a height of 20-30 ft., the height increasing as evening advances and the shadows creep up the trees. They disappear at sundown. I have also occasionally seen them flying comparatively low over an open marsh at the mouth of a broad, sluggish, weed-grown creek, in which the nymphs probably breed, as it is the only suitable-looking place in the vicinity.

Since my list was published I have added another species of *Somatochlora*, *S. Walshii* (Scudd.), to the Ontario fauna, and Mr. Williamson has taken a number of specimens of *S. elongata* (Scudd.) at Hayden's, Algoma. So that the Ontario records for this genus now stand as follows:—

S. elongata (Scudd.) Algonquin Park, Hayden's, July 31, 1906.

S. Williamsoni, n. sp. Toronto, L. Simcoe, Temagami.

S. Walshii (Scudd.) De Grassi Point, Lake Simcoe, Aug. 7, 1906;
1 ♂ flying leisurely over field near edge of wood.

S. forcipata (Scudd.) Algonquin Park.

S. tenebrosa (Say.) Hamilton (?)

Several other species will be sure to appear in the north.

EXPLANATION OF PLATE 2.

Fig. 1. *Somatochlora Williamsoni*, n. sp.—Lake Simcoe, Ont., dorsal view of ♂ abdominal appendages; 1a, lateral view of same; 1b, dorsal view of ♀ appendages; 1c, lateral view of same.

Fig. 2. *S. elongata* (Scudd.)—Algonquin Park, Ont., dorsal view ♂ appendages; 2a, same, lateral view.

Fig. 3. *S. minor*, Calv.—Type specimen, Franconia, N. H., dorsal view ♂ appendages; 3a, same, lateral view.